INSTRUCTION MANUAL

CD-ROM DRIVE

MODEL **CDR-7930**

IMPORTANT
- Read all of these instructions carefully and understand them before using your CD-ROM drive.
- Keep this instruction manual for future reference.
- If this CD-ROM drive changes ownership, be sure this manual accompanies the CD-ROM drive.

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READ AND KEEP THIS MANUAL

For USA

Note : This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orientate or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

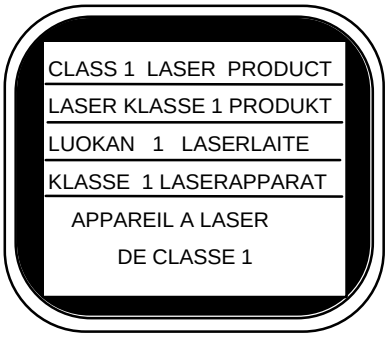
Caution :

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For Germany / Für Deutschland

Module dürfen nur an eine Sicherheits-Kleinspannungs-Versorgung(SELV-Kreise) nach EN60950/VDE 0805 angeschlossen werden. Die Trennung von Netzspannung muß durch einen Sicherheitstransformator geschehen.

The equipment is classified as a Class 1 level Laser product.



This label is fixed to the bottom of the CD-ROM Drive.

CAUTION	INVISIBLE LASER RADIATION WHEN OPEN. DO NOT STARE INTO BEAM OR VIEW DIRECTLY WITH OPTICAL INSTRUMENTS.
VORSICHT	UNSICHTBARE LASERSTRAHLUNG, WENN ABDECKUNG GEÖFFNET. NICHT IN DEN STRAHL BLICKEN AUCH NICHT MIT OPTISCHEN INSTRUMENTEN.
ATTENTION	RADIATION DU FAISCEAU LASÉR INVISIBLE EN CAS D'OUVERTURE EVITER TOUTE EXPOSITION AUX RAYONS.
ADVARSEL	USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNCTION. SE IKKE IND I STRÅLEN - HELLER IKKE MED OPTISKE INSTRUMENTER.
ADVARSEL	USYNLIG LASERSTRÅLING NÅR DEKSEL ÅPNES OG SIKKERHEDSLÅS BRYTES. STIRR IKKE INN I STRÅLEN ELLER SE DIREKTE MED OPTISKE INSTRUMENTER.
VARNING	OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. STIRRA EJ IN I STRÅLEN OCH BETRAKTA EJ STRÅLEN GENOM OPTISKT INSTRUMENT.
VARO !	AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASER-SÄTEILYLLE. ÄLÄ TUIJOTA SÄTEESEEN ÄLÄKÄ KATSO SITÄ OPTISEN LAITTEEN LÄPI.

For Europe

Caution - Use of controls or adjustments or peformance of procedures other than those specified herein may resultin hazardous radiation exposure.

DEFINITIONS AND A SYMBOL

The following symbol and signal word are used throughout this instruction manual with the following definitions.

	This symbol indicates any condition or particle, which if not strictly observed, could result in damage or destruction of the equipment.
IMPORTANT	Important notes indicate a subject of common errors in operation or maintenance.

IMPORTANT SAFEGUARDS

SAFETY POINTS YOU SHOULD KNOW ABOUT YOUR EQUIPMENT

READ ALL INSTRUCTIONS.
SAVE THESE INSTRUCTIONS FOR LATER USE.
FOLLOW ALL WARNINGS AND INSTRUCTIONS MARKED ON THE PRODUCT.

PRECAUTIONS FOR SAFETY

Power source

-This CD-ROM Drive should be operated from the type of power source indicated on the marked label. (+12V DC / +5V DC)

To avoid the risk of electric short circuits or damage to your CD-ROM drive

- Do not expose your CD-ROM Drive to rain or moisture.
- Do not open or remove the cover of your CD-ROM Drive. It may cause personal injury by rapid rotating disc.
- Turn off your SYSTEM and unplug the power supply cable of your SYSTEM from the wall outlet before installing your CD-ROM Drive, interface card or connecting cables.
- Do not allow liquids and foreign objects to get in .
- Do not place heavy loads on the CD-ROM Drive.
- Do not use this CD-ROM Drive without mounting it.
- Firmly attach the DC power supply cable, connecting cables between the CD-ROM Drive and other devices and keep them connected securely.

In case of failure

In case of the following conditions, turn off the SYSTEM including the CD-ROM Drive and unplug the power supply cable of the SYSTEM from the wall outlet immediately.

Do not attempt to service the CD-ROM Drive yourself and refer servicing to qualified service personnel immediately.

- If objects of any kind have been entered into your CD-ROM Drive
- If liquid has been spilled into your CD-ROM Drive
- If your CD-ROM Drive has been exposed to rain or water
- If your CD-ROM Drive does not operate normally when the operating instructions are followed
- If your CD-ROM Drive has been dropped or your CD-ROM Drive has been damaged
- If your CD-ROM Drive exhibits a distinct change in performance

PRECAUTIONS FOR USE

Installation conditions

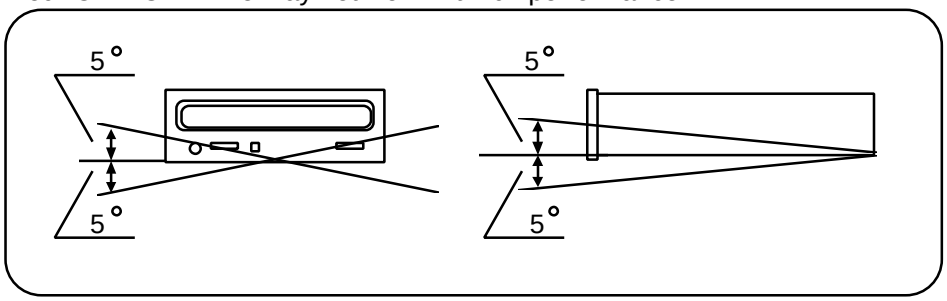
Do not install your CD-ROM Drive under the following conditions. It may lead to trouble or affect performance by dust on the pick-up lens and the disc, by heat or vibration.

- In a place where an operation temperature reaches beyond the specified temperature 40C
- High humidity locations
- In a location subject to extreme changes of temperature and humidity
- In a room where dust density higher than 0.1 mg/m^3
- In a room that has air conditioning with humidity control which may scatter calcium combinations and other powdered substances
- In a room containing exhaust gas fumes such as exhaust gas from gasoline or diesel engines or corrosive gas such as H_2S (Hydrogen sulfide)
- In a location subject to vibration and jarring during drive operation
- In a location subject to sudden shock and jolt during drive operation

Mounting requirements

Mount your CD-ROM drive tightly in horizontal or vertical position by screws.
The inclination of your CD-ROM Drive should be within 5° as shown below. If you do not,

- When the Disc Tray is opened, the disc may jump out and may be damaged.
- It may cause damage to your CD-ROM drive.
- Your CD-ROM Drive may not work with full performance.



Mounting screw

The screws must be ISO (M3 x 0.5) to mount the CD-ROM Drive tightly and avoid damaging the mechanism inside the CD-ROM Drive. (See page 11)

Moving your CD-ROM Drive

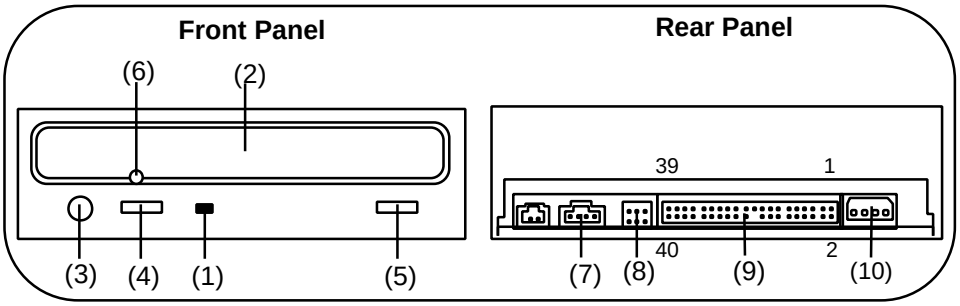
Remove the disc and close the Disc Tray before moving the CD-ROM Drive. If your CD-ROM Drive is moved with the disc loaded or the Disc Tray opened, both the disc and the CD-ROM Drive may be damaged.

PRECAUTIONS FOR CARE

Cleaning of the CD-ROM Drive, discs

- Never clean your CD-ROM Drive and discs with silicon cloths or cloths soaked in water, solvents (thinner, benzine), abrasive cleaner, anti-static sprays, any record cleaner sprays, liquid cleaner or aerosol cleaner. It may damage or discolor the coating of the CD-ROM Drive or damage or deform discs.
- Clean your CD-ROM Drive including the Disc Tray and discs with a clean, dry, soft cloth at least once a month.
- Clean your CD-ROM drive's pick-up lens using a cleaning disc.

CONTROLS AND FUNCTIONS



(1) LOADING/UNLOADING/BUSY Indicator

Indicator blinks green only when the Disc Tray is being opened or closed, or when the CD-ROM drive is accessing data.

(2) Disc Tray

When the power of the CD-ROM Drive is turned off, the Disc Tray can not be opened and closed.

(3) Headphone Jack (3.5 mm)

(4) Headphone Volume Control

Adjust the headphone volume.

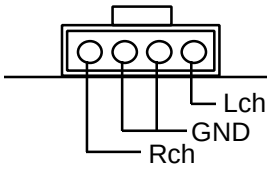
(5) OPEN/CLOSE Button

Press this button to open or close the Disc Tray.

(6) Manual Emergency Eject Hole

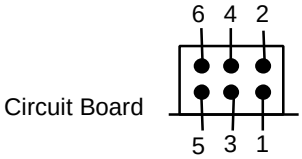
Only in case of emergency:
If the Disc Tray does not open when the OPEN/CLOSE Button is pressed, the CD-ROM Drive's Manual Emergency Eject mechanism may be activated.
This should be used only in case of emergency.
See Page 9 about Manual Emergency Eject Procedure.

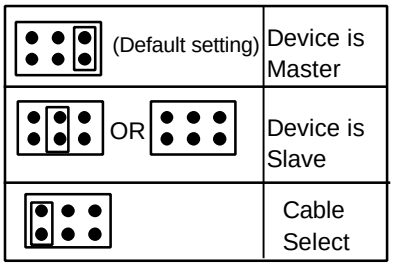
(7) Audio Output Terminal



(8) Device Configuration Jumper

This Connector is used to set operation modes such as Master, Slave and CSEL



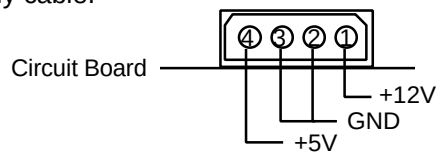


(9) ATAPI Interface Connector

ATAPI bus connection (40 pin)

(10) Power Supply Connector (DC Input)

For connecting the power supply cable.



INSTALLATION

WHAT YOU NEED

HARDWARE

- CD-ROM Drive
- Interface card
- Interface cable
- Power supply cable
- Mounting screws

HARDWARE OPTION

- Audio connecting cable
- Sound Card

SOFTWARE

- CD-ROM device driver

NOTE

If you need a interface card or interface cable or CD-ROM device driver, contact your dealer.

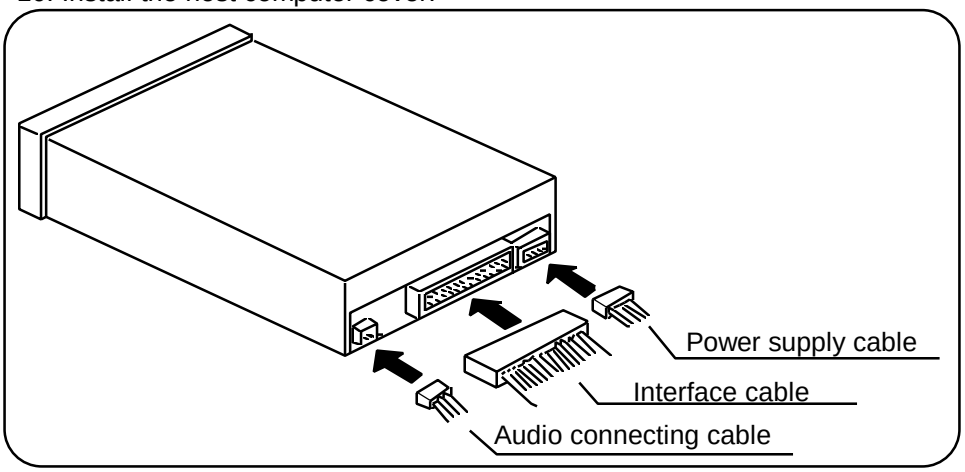
HARDWARE INSTALLATION

To install this CD-ROM drive in the host computer, refer to the instruction manual of each host computer.

And to install the interface card in the host computer, refer to the instruction manual of each host computer and each interface card.

Install the CD-ROM Drive following general installation procedure shown below.

1. Check the Device Configuration Jumper settings of the CD-ROM Drive such as Master, Slave, CSEL. (See page 6)
2. Turn off the host computer and unplug the power supply cable of the host computer.
3. Remove the host computer cover.
4. Install the CD-ROM Drive into the host computer and mount tightly by screws.
5. Check the settings of the interface card.
6. Install the interface card in the slot.
7. Firmly attach the interface cable from the interface card to the CD-ROM Drive.
8. Firmly attach Audio connecting cable as required.
9. Finally attach a spare DC power supply cable from the computer power supply to the CD-ROM Drive firmly.
10. Install the host computer cover.

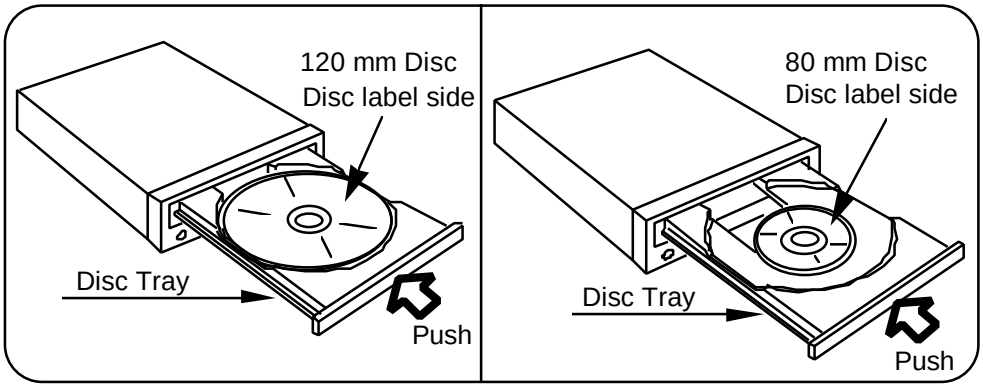


SOFTWARE INSTALLATION

To install CD-ROM device driver in the host computer to operate this CD-ROM Drive, refer to the instruction manual of each CD-ROM device driver.

DRIVE OPERATION

1. Turn on the SYSTEM including the CD-ROM Drive.
2. Press the OPEN/CLOSE button of the CD-ROM Drive to open the Disc Tray.
3. Place the disc in the center of the Disc Tray with label side up as shown below.
4. To close the Disc Tray, press the OPEN/CLOSE button on the CD-ROM Drive or push lightly the center of the front of the Disc Tray as shown below. The disc Tray will close the rest of the way automatically.
5. Operate referring to the instruction manual of CD-ROM device driver.



IMPORTANT

- Do not press the OPEN/CLOSE button while the host computer is accessing the disc. It may caused an error.
- When not using the CD-ROM Drive, keep the Disc Tray closed. It will prevent the entry of the dust and dirt, and reduce the requirements for disc and lens cleaning

⚠ CAUTION

If you do not observe the following items, troubles, such as that the Disc Tray can not be opened or can not be closed, may occur or it may cause damage to the mechanism of the CD-ROM Drive.

- Never use a damaged, broken or deformed disc.
- Do not press down hard on the Disc Tray when opening and closing the Disc Tray.

EMERGENCY EJECT PROCEDURE

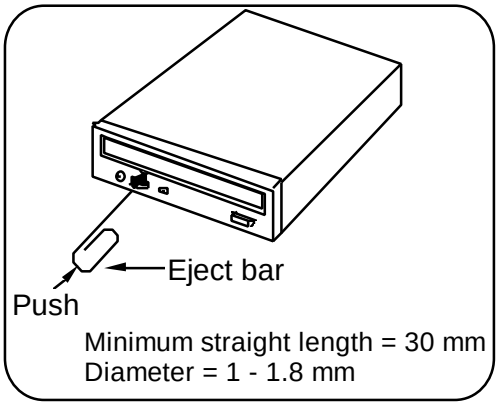
Only in case of emergency:
If the Disc Tray does not open when the OPEN/CLOSE Button is pressed, make sure that the power of the CD-ROM Drive is turned on and software lock function has not been used. If the Disc Tray still will not open, the CD-ROM Drive's Manual Emergency Eject mechanism may be activated.
This should be used only in case of emergency.

REMOVAL PROCEDURE

1. Turn off the CD-ROM Drive and wait at least 15 seconds till the disc stops rotating.
2. Insert the Eject bar (for example, a straightened paper clip) into the Manual Emergency Eject Hole about 25 mm (1 inch).
3. Pull the Disc Tray

⚠ CAUTION

Do not use a breakable bar.
A broken bar inside the CD-ROM Drive may cause a malfunction.



Minimum straight length = 30 mm
Diameter = 1 - 1.8 mm

Lens Cleaning

A commercially available "Laser Lens Cleaning Disc" may be used to clean up the pick-up lens of the CD-ROM Drive.
Use the Compact Disc Laser Lens Cleaner LLC-1. (by AUDIO SOURCE in U.S.A., by AKUSTIK SISTEME VERTRIEBS GHBH in GERMANY and by SAEC COMMERCE CO.,LTD. in JAPAN.)

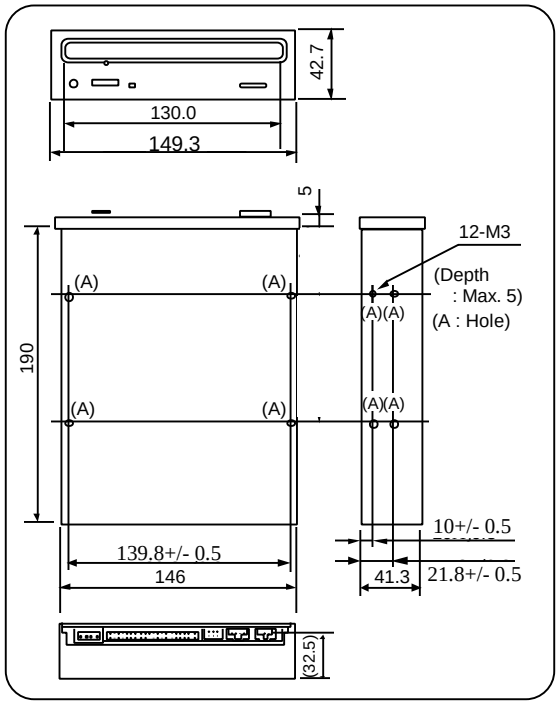
(1) Turn on the CD-ROM Drive.
(2) Using the small brush supplied with the cleaning disc case, straighten up the disc cleaning brushes on the back of the cleaning disc.
(3) Place the cleaning disc in the Disc Tray with its arrow marked on the disc at front.
(4) Press the OPEN/CLOSE button or push the center of the Disc Tray lightly and close the Disc Tray.
(5) In about 20 seconds, the pick-up lens is cleaned by the cleaning disc.
(6) Press the OPEN/CLOSE button and remove the cleaning disc.
(7) Set the cleaning disc in its case with the disc cleaning brushes in the pad hole.
(8) Restart the SYSTEM.

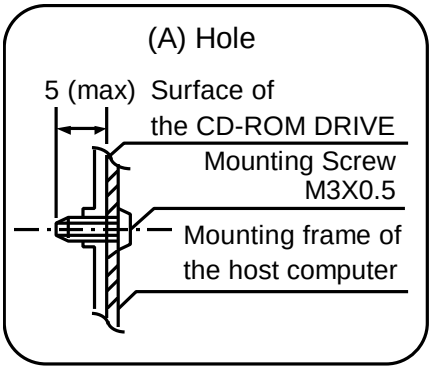
TROUBLESHOOTING

- If your CD-ROM Drive does not operate properly, check the following table.
- You may have to check the other devices included in your SYSTEM.
- If you can not locate the cause, turn off the power of the SYSTEM including the CD-ROM Drive and unplug the power supply cable of the SYSTEM from the wall outlet immediately and contact your dealer.
- When calling for service, provide the following information :
  1. Model name
  2. Detailed symptoms

Symptoms	Possible causes	Remedy
The CD-ROM Drive does not operate even when a disc is loaded.	1.You place the disc up-side down in the Disc Tray. 2. The disc is dirty. 3. The pick-up lens is dirty. 4.The disc is scratched or warped. 5.Cable connection is incorrect.	1.Place the disc right side up in the Disc Tray, then load it. 2.Clean the disc surface.(See page 4) 3.Clean up the pick-up lens.(See page 10) 4.Change the disc. 5.Turn off your SYSTEM and re-connect cables correctly.
The Disc Tray can not beopened.	The program is incorrect. It is locked by the program.	Check the program. Check the program.
Communications between the host computer and the devices on the interface cable can not be done.	There are devices with the same Device Configuration jumper setting on the interface cable.	Give each device a different Device Configuration Jumper setting.

MECHANICAL DIMENSIONS





Dimensions (unit : mm)

SPECIFICATIONS

GENERAL

Power Requirements	DC Voltage	+12V	±10%	1.0A
		+5V	±5%	0.7A
	Ripple	+12V	300 mVpp (maximum)	
		+5V	150 mVpp (maximum)	
Dimensions (W x H x D)		146 x 41.3 x 190 mm (Excluding front panel)		
		Front panel : 149.3 x 42.7 x 5 mm		
Mass		0.95 kg		
Operating & Storage Conditions				
	Temperature	5 - 45 °C	(operating)	
		-30 - 60 °C	(non-operating)	
	Relative humidity	15 - 85% RH	(operating) (non-condensing)	
		10 - 90% RH	(non-operating) (non-condensing)	

PERFORMANCE

Disc Diameter	120 mm, 80 mm	
Rotational speed	71.3 - 52.7 s^{-1} (Approx. 4,200 - 3,200 rpm)	
Capacity (1M=2^{20}=1,048,576)	650 Mbytes (Mode 1)	
	742 Mbytes (Mode 2)	
	Conditions : 333,000 blocks (74 min.) for recorded area	
Record Side	Single side	
Sustained Data Transfer Rate (1k=2^{10}=1,024)	1,200 - 2,400 kbytes/s	(Mode 1)
Access Time		
Average (1 / 3 - Stroke)	90 ms	(Typical) (Note 1)
Full Stroke	150 ms	(Typical) (Note 2)

Notes :

1) Average of 100 access operations, between 15-min 00-s 00-block and 35-min 00-s 00-block, with latency.
2) Average of 100 access operations, between 00-min 02-s 00-block and 59-min 59-s 74-block, with latency.

AUDIO PERFORMANCE

Number of Channels	2
Output Level	Line : 0.7 Vrms TYP. (47 kohms load)
	Headphone : 0.6 Vrms TYP. (32 ohms load)
Output Terminal	Line : 4-pin terminal (2.54 mm pitch)
	Headphone out : ø3.5 mm Jack

RELIABILITY

Data Error Rate	10^{-12} or less	(Mode 1)*
	10^{-9} or less	(Mode 2)*

* Raw error rate assumed to be 10^{-3} or less.

INTERFACE

ATAPI - BUS
40-pin non-shielded connector

Note

Design and specifications are subject to change without prior notice.
Hitachi has done everything possible to prevent the failure of the CDR-7930. However, it is not absolutely free from failure. In case it should fail, Hitachi is not responsible for the results.